Amendments to the Claims:

Please amend the claims as follows:

1. (Original) A method of analyzing a sample that is comprised of a plurality of thin films formed on a substrate, the method comprising:

providing an expected configuration of at least a first and second thin film formed on the substrate;

determining, based at least in part on the expected configuration, at least one optical property of the first thin film that is predominantly defined in a range of wavelengths that are below deep-ultra violet (DUV) wavelengths and at least one optical property of the second thin film that is not predominantly defined in a range of wavelengths that are below deep-ultra violet (DUV) wavelengths;

recording an optical response data set of the sample over a range of wavelengths that includes at least a plurality wavelengths below deep-ultra violet (DUV) wavelengths; and

characterizing at least one property of the first thin film by weighting the recorded optical response data set based upon the determination of the at least one optical property of the first thin film that is predominantly defined in a range of wavelengths that are below deep-ultra violet (DUV) wavelengths and the determination of at least one optical property of the second thin film that is not predominantly defined in a range of wavelengths that are below deep-ultra violet (DUV) wavelengths.

2. (Original) The method of claim 1, wherein the characterizing further comprising iteratively reducing the optical response data set by relating the recorded optical response to the at least one property of the first thin film by advantageously exploiting the at least one optical property of the first thin film that is predominantly defined in a range of wavelengths that are below deep-ultra violet (DUV) wavelengths.

3. (Original) The method of claim 2, wherein the iterative data reduction is accomplished through the application of a dynamic weighting function wherein greater or lesser emphasis on

specific datum is ascribed during an optimization process depending on the expected contribution of the datum to the determination of physical parameters sought and wherein the expected contribution is dynamically estimated based on the expected configuration of at least a first and second thin film formed on the substrate and is updated on an iteration by iteration basis.

4. (Original) The method of claim 3, wherein the property of the first thin film characterized comprises at least one of film thickness, optical properties, composition, interface roughness, surface roughness or porosity.

5. (Original) The method of claim 1, wherein the property of the first thin film characterized comprises at least one of film thickness, optical properties, composition, interface roughness, surface roughness or porosity.

6. (Original) The method of claim 1 wherein the optical response from the first thin film is recorded using a reflectometer that comprises a spectrometer and an array detector.

7. (Original) The method of claim 1, wherein the recorded optical response is obtained by simultaneously obtaining reflectance data for wavelengths below DUV wavelengths for multiple sites within a two dimensional area of the sample.

8. (Original) A method of analyzing a miniature device that is comprised of at least one thin film formed on a substrate, the method comprising:

providing an expected configuration of the at least one thin film;

determining, based at least in part on the expected configuration, at least one device optical property that is predominantly defined in a range of wavelengths that are below deep-ultra violet (DUV) wavelengths;

utilizing a reflectometer to record an optical response data set of the device over a range of wavelengths that includes at least a plurality wavelengths below deep-ultra violet (DUV) wavelengths; and

characterizing at least one physical property of the device by weighting the recorded optical response data set based upon the determination of the at least one optical property that is predominantly defined in a range of wavelengths that are below deep-ultra violet (DUV) wavelengths.

9. (Original) The method of claim 8, wherein the physical property determined as a result of the measurement comprises at least one of line width, sidewall angle, line height, trench depth, trench width and film thickness.

10. (Original) The method of claim 9, wherein the device is a semiconductor device.

11. (Original) The method of claim 8, wherein the characterizing further comprising iteratively reducing the optical response data set by relating the recorded optical response to the at least one physical property by advantageously exploiting the at least one optical property that is predominantly defined in a range of wavelengths that are below deep-ultra violet (DUV) wavelengths.

12. (Original) The method of claim 11, wherein the iterative data reduction is accomplished through the application of a dynamic weighting function wherein greater or lesser emphasis on specific datum is ascribed during an optimization process depending on the expected contribution of the datum to the determination of physical parameters sought and wherein the expected contribution is dynamically estimated based on the expected configuration of the device and is updated on an iteration by iteration basis.

13. (Original) The method of claim 12, wherein the physical property determined as a result of the measurement comprises at least one of line width, sidewall angle, line height, trench depth, trench width and film thickness.

14. (Currently Amended) The method of claim 13, wherein the optical response data set is reflectivity data obtained through the use of ~~a~~ the reflectometer.

15. (Currently Amended) The method of claim 8, wherein the optical response data set is reflectivity data obtained through the use of ~~a~~ the reflectometer.

16. (Original) The method of claim 15, wherein the reflectometer comprises:

at least one environmentally controlled chamber in which a light beam travels, the chamber sufficiently controlled to allow transmission of wavelengths below DUV light;

a spectrometer that receives at least a portion of the light beam, the spectrometer providing multiple spatially separated wavelengths of light at an exit plane of the spectrometer, the multiple spatially separated wavelengths of light including wavelengths of light below DUV wavelengths; and

an array detector that receives the multiple spatially separated wavelengths of light, the array detector detecting data for wavelengths below DUV wavelengths.

17. (Original) The method of claim 16, wherein the reflectometer further comprises a sample channel light path and a reference channel light path, wherein the reference channel light path is configured to collect data that may be utilized to account for system or environmental changes to adjust reflectance data obtained through the use of the reflectometer.

18. (Original) The method of claim 17, wherein a dynamic weighting function is utilized to place greater or lesser emphasis on specific datum during an optimization process depending on the expected contribution of the datum to the determination of physical parameters sought and wherein the expected contribution is dynamically estimated based on the expected configuration of the device and is updated on an iteration by iteration basis.

19. (Original) The method of claim 15, wherein the reflectometer comprises a sample channel light path and a reference channel light path, wherein the reference channel light path is configured to collect data that may be utilized to account for system or environmental changes to adjust reflectance data obtained through the use of the reflectometer.

20. (Original) The method of claim 19, wherein a dynamic weighting function is utilized to place greater or lesser emphasis on specific datum during an optimization process depending on the expected contribution of the datum to the determination of physical parameters sought and wherein the expected contribution is dynamically estimated based on the expected configuration of the device and is updated on an iteration by iteration basis.

21. (Original) The method of claim 8, wherein the recorded optical response is obtained by simultaneously obtaining reflectance data for wavelengths below DUV wavelengths for multiple sites within a two dimensional area of the device.

22. (Original) An apparatus for analyzing a substrate that is comprised of at least one thin film formed on a substrate, the apparatus comprising:

a light source that provides a source beam having at least wavelengths below DUV wavelengths;

at least one environmentally controlled chamber in which a light beam travels, the chamber sufficiently controlled to allow transmission of wavelengths below DUV light;

a sample channel light path that is configured to encounter the substrate;

a reference channel light path that is configured to provide a path that does not encounter the substrate, wherein the reference channel light path is configured to collect data that may be utilized to account for system or environmental changes to adjust reflectance data obtained through the use of the reflectometer;

a spectrometer that receives at least a portion of the source beam, the spectrometer providing multiple spatially separated wavelengths of light at an exit plane of the spectrometer, the multiple spatially separated wavelengths of light including wavelengths of light below DUV wavelengths;

an array detector that receives the multiple spatially separated wavelengths of light, the array detector simultaneously obtaining reflectance data for wavelengths below

DUV wavelengths for multiple sites within a two dimensional area of the substrate; and

a data processor coupled to the array detector to receive the substrate reflectance data, the data processor configured to:

receive data relating to an expected configuration of the at least one thin film,

determine, based at least in part on the expected configuration, at least one thin film optical property that is predominantly defined in a range of wavelengths that are below deep-ultra violet (DUV) wavelengths,

record an optical response data set of the substrate over a range of wavelengths that includes at least a plurality wavelengths below deep-ultra violet (DUV) wavelengths, and

characterize at least one physical property of the thin film by weighting the recorded optical response data set based upon the determination of the at least one optical property that is predominantly defined in a range of wavelengths that are below deep-ultra violet (DUV) wavelengths.

23. (Original) The apparatus of claim 22, wherein the physical property characterized comprises at least one of line width, sidewall angle, line height, trench depth, trench width and film thickness.

24. (Original) The apparatus of claim 23, wherein the substrate is a semiconductor device.

25. (Original) The method of claim 22, wherein the physical property characterized comprises at least one of film thickness, optical properties, composition, interface roughness, surface roughness or porosity.

26. (Original) The apparatus of claim 22, wherein the characterizing further comprising iteratively reducing the optical response data set by relating the recorded optical response to the at least one physical property by advantageously exploiting the at least one optical property that

is predominantly defined in a range of wavelengths that are below deep-ultra violet (DUV) wavelengths.

27. (Original) The apparatus of claim 26, wherein the iterative data reduction is accomplished through the application of a dynamic weighting function wherein greater or lesser emphasis on specific datum is ascribed during an optimization process depending on the expected contribution of the datum to the determination of physical parameters sought and wherein the expected contribution is dynamically estimated based on the expected configuration of the substrate and is updated on an iteration by iteration basis.

28. (Original) The apparatus of claim 27, wherein the physical property characterized comprises at least one of line width, sidewall angle, line height, trench depth, trench width and film thickness.

29. (Original) The method of claim 28, wherein the physical property characterized comprises at least one of film thickness, optical properties, composition, interface roughness, surface roughness or porosity.

30. (Original) The apparatus of claim 22, wherein the light source provides a source beam having at least wavelengths below 140 nm.

31. (Original) The apparatus of claim 30, wherein the at least one thin film optical device property is predominately defined in a region of wavelengths less than about 140 nm and the physical property determined as a result of the measurement comprises at least one of line width, sidewall angle, line height, trench depth, trench width and film thickness.

32. (Original) The apparatus of claim 22, further comprising a camera utilized to identify the two dimensional area of the substrate.